

CLAIMS

1. An active-matrix display apparatus, comprising:

a substrate;

5 an electrode for provision of a display element included in each of a plurality of pixels provided on the substrate;

a first transistor that is connected to the electrode and a first current-source line and that determines on or 10 off state of the display element by using a voltage applied to a gate thereof;

a second transistor that is connected to the gate of the first transistor and a data-storing signal line and that determines a gate voltage of the first transistor by using a 15 voltage in a gate signal line connected to a gate of the second transistor;

a storage capacitor connected to the current-source line and the gate of the first transistor, for storing a voltage signal supplied from the data-storing signal line 20 via the second transistor, while the second transistor is in an on state; and

a third transistor that has a source and a drain connected to the electrode and a gate signal line for a display element other than said display element, and that 25 has a gate controlled such that current flowing from the

first transistor to the electrode is led to the gate signal line for the other display element.

2. The display apparatus according to claim 1, wherein the gate of the third transistor is connected to a second 5 current-source line for the display element other than the display element to thereby perform control such that the gate is put into an on state or off state.

3. The display apparatus according to claim 1, wherein the gate of the third transistor is connected to the gate 10 signal line for the other display element to thereby perform control such that the gate is put into an on state or an off state.

4. An active-matrix display apparatus, comprising:

a substrate;

15 an electrode for provision of a display element included in each of a plurality of pixels provided on the substrate;

a first transistor that is connected to the electrode and a first current-source line and that determines on or 20 off state of the display element by using a voltage applied to a gate thereof;

a second transistor that is connected to the gate of the first transistor and a data-storing signal line and that determines a gate voltage of the first transistor by using a 25 voltage in a gate signal line connected to the gate the

second transistor;

a storage capacitor connected to the current-source line and the gate of the first transistor for storing a voltage signal supplied from the data-storing signal line 5 via the second transistor, while the second transistor is in an on state; and

a third transistor that has a source and a drain connected to the electrode and the gate signal line, and that has a gate put into an on state or an off state by 10 changing a potential of a gate signal line for a display element other than said display element, so that current flowing from the first transistor to the electrode is led to the gate signal line.

5. The display apparatus according to one of claims 1 to 15, wherein the display element is an organic EL element.

6. The display apparatus according to one of claims 1 to 5, wherein the gate of the third transistor is connected to a power-source supply line that is additionally provided.

7. The display apparatus according to claim 6, wherein 20 the gate of the third transistor is connected to a current-releasing line that is additionally provided.

8. The display apparatus according to one of claims 1 to 7, wherein the third transistor is p-type.

9. The display apparatus according to one of claims 1 to 25, wherein a line from the third transistor is connected to

a peripheral circuit for simultaneously controlling two or more of the display elements when the display apparatus is in an operation state, and the third transistors are sequentially switched via the peripheral circuit.

5 10. A method for inspecting each display element of the active-matrix display apparatus according to one of claims 1 to 9, the method comprising the steps of:

storing charge into the storage capacitor by controlling a gate voltage of the second transistor;

10 controlling the gate of the third transistor by changing a potential of a first line for a display element other than the display element to be inspected; and

measuring an amount of charge or current flowing from the electrode via the third transistor, by using a measuring 15 unit connected to the first current-source line for the display element to be inspected.

11. A display apparatus, comprising:

a substrate;

an electrode for provision of a display element

20 included in each of a plurality of pixels provided on the substrate;

a first transistor that is connected to the electrode and a current-source line and that determines on or off state of the display element by using a voltage applied to a 25 gate thereof;

a second transistor that is connected to the gate of the first transistor and a data-storing signal line and that determines a gate voltage of the first transistor by using a voltage in a gate signal line connected to a gate of the 5 second transistor;

a storage capacitor connected to the current-source line and the gate of the first transistor for storing a signal supplied from the data-storing signal line via the second transistor, while the second transistor is in an on 10 state; and

a diode connected to the electrode and to a gate signal line for a display element other than the display element.

12. The display apparatus according to claim 11, wherein the display element is an organic EL element.

15 13. The display apparatus according to claim 11 or 12, wherein the diode is connected to a current-releasing line that is additionally provided.

14. A method for inspecting each pixel of the active-matrix display apparatus according to one of claims 10 to 13, 20 the method comprising the steps of:

storing charge into the storage capacitor by controlling the gate of the second transistor; and

measuring an amount of charge or current flowing from the electrode via the diode by changing a potential of a 25 first line for a display element other than the display

element to be inspected and using a measuring unit connected to a second line for the display element other than the display element to be inspected.

15. An active-matrix display apparatus, each pixel
5 included in the display apparatus comprising:

an electrode connected to a display element for the pixel;

a first transistor connected to the electrode and to a first line for the pixel;

10 a second transistor connected to a gate of the first transistor and to a data-storing signal line for supplying a voltage signal;

a storage capacitor connected to the gate of the first transistor and to a second line for the pixel, and

15 a load capacitor connected to the electrode and the gate of the first transistor such that charge is accumulated by current flowing from the first transistor to the electrode.

16. The display apparatus according to claim 12, wherein
20 the display element is an organic EL element.

17. A method for inspecting each pixel of the active-matrix display apparatus according to claim 15 or 16, the method comprising the steps of:

supplying a first voltage to the first transistor;

25 storing charge into the storage capacitor and the load

capacitor by temporarily turning on and turning off the second transistor through control of the gate signal line connected to the gate of the second transistor to thereby apply a voltage of the data-storing signal line to the gate 5 of the first transistor;

measuring an amount of charge stored in the storage capacitor by turning on the second transistor and using a charge measuring unit connected to the data-storing signal line;

10 obtaining, for each pixel, a difference between the amount of measured charge and an amount of charge when the first voltage is supplied; and

determining whether the difference is in a predetermined range.

15 18. The method according to claim 17, wherein in the step of reducing the first voltage, the first voltage is reduced to a predetermined voltage that is lower than the voltage of the electrode in the step of storing the charge.

19. The method according to claim 17 or 18, further 20 comprising a step of pre-resetting the amount of charge stored in the storage capacitor, prior to the step of supplying the first voltage to the first transistor.

20. The method according to claim 17, wherein in the step of reducing the first voltage, the first voltage is reduced 25 until the first transistor is turned off by a threshold

voltage of the first transistor.

21. An active-matrix display apparatus, comprising:

a substrate;

an electrode for provision of a display element

5 included in each of a plurality of pixels provided on the substrate;

a first transistor connected to the electrode and to a current-source line;

10 a second transistor connected to a gate of the first transistor and to a data-storing signal line, a gate signal line being connected to a gate thereof;

a storage capacitor connected to the gate of the first transistor and to the current-source line; and

15 a load capacitor connected to the electrode and to the gate of the second transistor of another display element such that charge is accumulated by current flowing when the first transistor is turned on.

22. An active-matrix display apparatus, comprising:

a substrate;

20 an electrode for provision of a display element

included in each of a plurality of pixels provided on the substrate;

a first transistor connected to the electrode and to a current-source line;

25 a second transistor connected to a gate of the first

transistor and to a data-storing signal line with a gate signal line being connected to a gate thereof;

a storage capacitor connected to the gate of the first transistor and to the current-source line; and

5 a load capacitor connected to the electrode and to the gate of the second transistor of the same display element and connected to the gate signal line such that charge is accumulated by current flowing when the first transistor is on.

10 23. The display apparatus according to claim 21 or 22, wherein the display element is an organic EL element.

24. A method for inspecting each display element of the active-matrix display apparatus according to one of claims 21 to 23, the method comprising the steps of:

15 storing charge into the storage capacitor by controlling the gate of the second transistor; and measuring an amount of charge or current flowing from the electrode, by changing a potential of a gate signal line for a display element other than the display element to be 20 inspected and using a measuring unit connected to the current-source line for the display element to be inspected.

25. The active-matrix display apparatus according to one of claims 1 to 9, claims 11 to 13, claims 15 and 16, and claims 21 to 23, wherein the other display element is adjacent to the display element to be inspected.

26. The method for inspecting the active-matrix display apparatus according to one of claims 10, 14, 17, 18, 19, 20, and 24, wherein the other display element is adjacent to the display element to be inspected.

5 27. An active-matrix display apparatus, comprising:

 a substrate;

 an electrode for provision of a display element included in each of a plurality of pixels provided on the substrate;

10 a first transistor that is connected to the electrode and a first current-source line and that determines on or off state of the display element by using a voltage applied to a gate thereof;

15 a second transistor that is connected to the gate of the first transistor and a data-storing signal line and that determines a gate voltage of the first transistor by using a voltage in a gate signal line connected to a gate thereof; and

20 a third transistor that has a drain connected to the electrode and that has a source and a gate connected to the gate signal line for the display element, so that current flowing from the first transistor to the electrode is led to the gate signal line for the display element.

28. An active-matrix display apparatus, comprising:

25 a substrate;

an electrode for provision of a display element included in each of a plurality of pixels provided on the substrate;

5 a first transistor that is connected to the electrode and a current-source line and that determines on or off state of the display element by using a voltage applied to a gate thereof;

10 a second transistor that is connected to the gate of the first transistor and a data-storing signal line and that determines a gate voltage of the first transistor by using a voltage in a gate signal line connected to a gate the second transistor; and

a diode connected to the electrode and to the gate signal line for the display element.

15 29. A method for inspecting each display element of the display apparatus according to claim 27 or 28, the method comprising the steps of:

20 controlling a gate voltage of the second transistor by changing a potential of the gate signal line for the display element to be inspected, supplying a voltage determined by the data-storing signal line to the gate of the first transistor, and controlling the gate of the third transistor or the diode; and

25 measuring an amount of charge or current flowing from the electrode via the third transistor or the diode, by

using a measuring unit connected to the gate signal line or the first current-source line.

30. An active-matrix display apparatus, comprising:

a substrate;

5 an electrode for provision of a display element included in each of a plurality of pixels provided on the substrate;

10 a first transistor that is connected to the electrode and a first current-source line and that determines on or off state of the display element by using a voltage applied to a gate thereof;

15 a second transistor that is connected to the gate of the first transistor and a data-storing signal line and that determines a gate voltage of the first transistor by using a voltage in a gate signal line connected to a gate the second transistor;

20 a third transistor that has a gate and a drain connected to the electrode and a gate line for a display element other than said display element, and whose gate is controlled such that current flowing from the first transistor to the electrode is led to a gate signal line for the other display element.

25 31. The display apparatus according to claim 30, wherein the gate of the third transistor is connected to the gate line for the display element, to thereby perform control

such that the gate is put into an on state or an off state.

32. A method for inspecting each display element of the display apparatus according to claim 30 or 31, the method comprising the steps of:

5 controlling a gate voltage of the second transistor by changing a potential of the gate signal line for the display element to be inspected, supplying a voltage determined by the data-storing signal line to the gate of the first transistor, and controlling the gate of the third
10 transistor; and

measuring current flowing from the electrode via the third transistor by using a measuring unit connected to the first current-source line for the display element to be inspected or to the gate signal line for the display element
15 other than the display element to be inspected.